

Listing of Claims

Claim 1 (Currently amended): A method of electrodepositing a layer of tin or tin-alloy on a substrate, comprising: electrolytically treating polishing a substrate at a constant current density and an increasing voltage with a solution comprising a phosphoric acid and a carboxylic acid; and electroplating a layer of tin or tin-alloy on a surface of the treated polished substrate.

Claim 2 (original): The method according to claim 1, wherein the substrate is constructed of a copper-containing metal or metal-alloy.

Claim 3 (original): The method according to claim 2, wherein the substrate is constructed of copper.

Claim 4 (currently amended): The method according to claim 1, wherein the ~~electronic device~~ substrate is a printed wiring board substrate, a lead frame, a semiconductor package, a chip capacitor, a chip resistor, a connector, or a contact.

Claim 5 (currently amended): The method according to claim 5 4, wherein the electronic device is a lead frame.

Claim 6 (currently amended): The method according to claim 1, wherein the phosphoric acid is orhtophosphoric acid present in the solution in an amount of from 20 to 80% by volume.

Claim 7 (original): The method according to claim 1, wherein the carboxylic acid is malic acid, tartaric acid, citric acid, lactic acid, or combinations thereof.

Claim 8 (original): The method according to claim 1, wherein the carboxylic acid is a hydroxycarboxylic acid.

Claim 9 (original): The method according to claim 1, wherein the solution further comprises an alkali metal hydroxide.

Claim 10 (original): The method according to claim 1, wherein the solution further comprises an organic solvent.

Claim 11 (original): The method according to claim 10, wherein the organic solvent is ethylene glycol, propylene glycol, glycerin, ethanol, isopropyl alcohol, or combinations thereof.

Claim 12 (canceled)

Claim 13 (currently amended): A method of electrodepositing a layer of tin or tin-alloy on a substrate, comprising: electrolytically treating polishing a substrate at a constant current density

and an increasing voltage with a solution comprising from 50 to 80% by volume of a carboxylic acid; and electrodepositing a layer of tin or tin-alloy on a surface of the treated polished substrate.

Claim 14 (original): The method according to claim 13, wherein the solution further comprises a phosphoric acid.

Claim 15 (original): The method according to claim 13, wherein the carboxylic acid is malic acid, tartaric acid, citric acid, lactic acid, or combinations thereof.

Claim 16 (original): The method according to claim 13, wherein the carboxylic acid is a hydroxycarboxylic acid.

Claim 17 (canceled)

Claim 18 (new): The method according to claim 1, wherein the voltage ranges from 3 to 20 V.

Claim 19 (new): The method according to claim 18, wherein the voltage ranges from 4 to 8 V.

Claim 20 (new): The method according to claim 1, wherein the current density is from 10 to 50 A/dm².

Claim 21 (new): The method according to claim 1, wherein the pH of the solution is from 0 to 3.